

What is claimed is:

1. A method of identifying a compound having the ability to modulate the guanine nucleotide exchange cycle of a Ras superfamily GTPase, comprising:

a) contacting the compound with a guanine nucleotide exchange factor and a GTPase and obtaining a baseline fluorescence measurement;

b) contacting the guanine nucleotide exchange factor and the GTPase without the compound and obtaining a baseline fluorescence measurement;

c) adding a fluorophore-conjugated GTP to the components of (a) and (b), respectively;

d) obtaining fluorescence measurements of the respective components of (c) over time;

e) subtracting the respective baseline fluorescence measurements of (a) and (b) from each fluorescence measurement of (d); and

f) comparing the resulting fluorescence values of (e), wherein a decrease or increase in the rate of fluorescence change with the compound as compared with the rate of fluorescence change without the compound identifies a compound having the ability to modulate the guanine nucleotide exchange cycle of a Ras superfamily GTPase.

2. A method of identifying a compound having the ability to inhibit guanine nucleotide exchange factor activity, comprising:

a) contacting the compound with a first guanine nucleotide exchange factor and a GTPase and obtaining a baseline fluorescence measurement;

b) contacting the first guanine nucleotide exchange factor and the GTPase without the compound and obtaining a baseline fluorescence measurement;

c) adding a fluorophore-conjugated GTP to the components of (a) and (b), respectively;

d) obtaining fluorescence measurements of the respective components of (c) over time;

e) subtracting the respective baseline fluorescence measurements of (a) and (b) from the fluorescence measurements of (d);

f) comparing the resulting fluorescence values of (e), wherein a decrease in the rate of fluorescence change with the compound as compared with the rate of fluorescence change without the compound identifies a compound potentially having the ability to inhibit guanine nucleotide exchange factor activity;

g) repeating steps a-e with a second guanine nucleotide exchange factor; and

h) comparing the resulting fluorescence values of (g), wherein no decrease in the rate of fluorescence change with the compound as compared with the rate of fluorescence change without the compound identifies a compound having the ability to inhibit guanine exchange factor activity.

3. A method of identifying a compound having the ability to inhibit GTPase activity, comprising:

a) contacting the compound with a guanine nucleotide exchange factor and a first GTPase and obtaining a baseline fluorescence measurement;

b) contacting the guanine nucleotide exchange factor and the first GTPase without the compound and obtaining a baseline fluorescence measurement;

c) adding a fluorophore-conjugated GTP to the components of (a) and (b), respectively;

d) obtaining fluorescence measurements of the respective components of (c) over time;

e) subtracting the respective baseline fluorescence measurements of (a) and (b) from the fluorescence measurements of (d);

f) comparing the resulting fluorescence values of (e), wherein a decrease in the rate of fluorescence change with the compound as compared with the rate of fluorescence change without the compound identifies a compound potentially having the ability to inhibit GTPase activity;

g) repeating steps a-e with a second GTPase; and

h) comparing the resulting fluorescence values of (g), wherein no decrease in the rate of fluorescence change with the compound as compared with the rate of fluorescence change without the compound identifies a compound having the ability to inhibit GTPase activity.

4. A method of identifying a compound having the ability to modulate effector/GTPase activity, comprising:

- a) contacting the compound with a GTPase and an effector protein and obtaining a baseline fluorescence measurement;
- b) obtaining a baseline fluorescence measurement of the GTPase and the effector protein without the compound;
- c) adding a fluorophore-conjugated GTP to the components of (a) and (b), respectively;
- d) obtaining fluorescence measurements of the respective components of (c) over time;
- e) subtracting the respective baseline fluorescence measurements of (a) and (b) from the fluorescence measurements of (d); and
- f) comparing the resulting fluorescence values of (e), wherein a decrease or increase in the rate of fluorescence change with the compound as compared with the rate of fluorescence change without the compound identifies a compound having the ability to modulate effector/GTPase activity.

5. The method of any of claims 1-4, wherein the guanine nucleotide exchange factor is selected from the group consisting of Ect2, Bcr, Abr, RasGRF, Sos, Neuroblastoma, S-GEF, Vsm-RhoGEF, N-GEF, Tim, Intersectin, Xpln, Net1, LARG, p115-RhoGEF, PDZ-RhoGEF, Lfc, Lbc, p114-RhoGEF, Alsln, Tuba, P-Rex, Asef, Tiam1, Tiam2, alpha-Pix, beta-Pix, Dbs, Db1, Trio, Duo, Duet, GEFT, Obscurin, Vav1, Vav2, Vav3, FGD1, Frabin, CDC25, ITSN, Sos1/2, any combination thereof and/or biologically active fragments or domains thereof.

6. The method of any of claims 1-4, wherein the GTPase is selected from the group consisting of H-Ras, N-Ras, R-Ras, K-Ras, Rap, Ral, Rab, Arf, Rad, Gem, Ran, RhoA, RhoB, RhoC, RhoD, RhoE, RhoF, RhoG, Cdc42, Rac1, Rac2, Rac3, TC10, TCL, Chp, Wrch, RhoBTB, any combination thereof and/or biologically active fragments or domains thereof.

7. The method of claim 4, wherein the effector protein is selected from the group consisting of Pak, Rock, Raf, any combination thereof and/or biologically active fragments or domains thereof.

8. A method of treating cancer in a subject, comprising administering to the subject an effective amount of a compound of this invention, for example, 3-(3-(dihydroxy(oxido)stibino)phenyl)acrylic acid, to modulate the guanine nucleotide exchange cycle of a Ras superfamily GTPase.

9. A method of treating cancer in a subject, comprising administering to the subject an effective amount of a compound of this invention, for example, 3-(3-(dihydroxy(oxido)stibino)phenyl)acrylic acid, to inhibit guanine nucleotide exchange factor activity.

10. A method of treating cancer in a subject, comprising administering to the subject an effective amount of a compound of this invention, for example, 3-(3-(dihydroxy(oxido)stibino)phenyl)acrylic acid, to inhibit GTPase activity.

11. A method of treating cancer in a subject, comprising administering to the subject an effective amount of a compound of this invention, for example, 3-(3-(dihydroxy(oxido)stibino)phenyl)acrylic acid, to modulate effector/GTPase activity.

12. A method of treating a neurological disorder in a subject, comprising administering to the subject an effective amount of a compound of this invention, for example, 3-(3-(dihydroxy(oxido)stibino)phenyl)acrylic acid, to modulate the guanine nucleotide exchange cycle of a Ras superfamily GTPase.

13. A method of treating a neurological disorder in a subject, comprising administering to the subject an effective amount of a compound of this invention, for example, 3-(3-(dihydroxy(oxido)stibino)phenyl)acrylic acid, to inhibit guanine nucleotide exchange factor activity.

14. A method of treating a neurological disorder in a subject, comprising administering to the subject an effective amount of a compound of this invention, for example, 3-(3-(dihydroxy(oxido)stibino)phenyl)acrylic acid, to inhibit GTPase activity.

15. A method of treating a neurological disorder in a subject, comprising administering to the subject an effective amount of a compound of this invention, for example, 3-(3-(dihydroxy(oxido)stibino)phenyl)acrylic acid, to modulate effector/GTPase activity.

16. A method of modulating the guanine nucleotide exchange cycle of a Ras superfamily GTPase in a cell, comprising contacting the cell with a compound of this invention, for example 3-(3-(dihydroxy(oxido)stibino)phenyl)acrylic acid.

17. A method of inhibiting guanine nucleotide exchange factor activity in a cell comprising contacting the cell with a compound of this invention, for example 3-(3-(dihydroxy(oxido)stibino)phenyl)acrylic acid.

18. A method of inhibiting GTPase activity in a cell, comprising contacting the cell with a compound of this invention, for example 3-(3-(dihydroxy(oxido)stibino)phenyl)acrylic acid.

19. A method of modulating effector/GTPase activity in a cell, comprising contacting the cell with a compound of this invention, for example 3-(3-(dihydroxy(oxido)stibino)phenyl)acrylic acid.

20. A composition comprising 3-(3-(dihydroxy(oxido)stibino)phenyl)acrylic acid, and a pharmaceutically acceptable carrier.